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AGRICULTURAL MARKETING

• SERVICES • MARKETING • STATISTICS • RESEARCH •

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Financing wholesale food markets • Grain transportation can be improved • Trends and prospects for frozen foods

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LOOKING INSIDE FRUIT

By Gerald S. Birth

Quality-conscious consumers today demand top-notch produce. They pick and choose carefully to get the right colored tomatoes. They squeeze and thump to find out if the cantaloupes and watermelons are firm. But they are never really sure what the fruit is like inside until they cut it open.

Neither are the wholesalers, processors, and handlers. The external color may appear to be good; the fruit may sound and feel firm. But is it?

How can one determine the presence of hollow heart in potatoes, brown core in apples, and blood spots in eggs? How, that is, without damaging the merchandise by actual sampling?

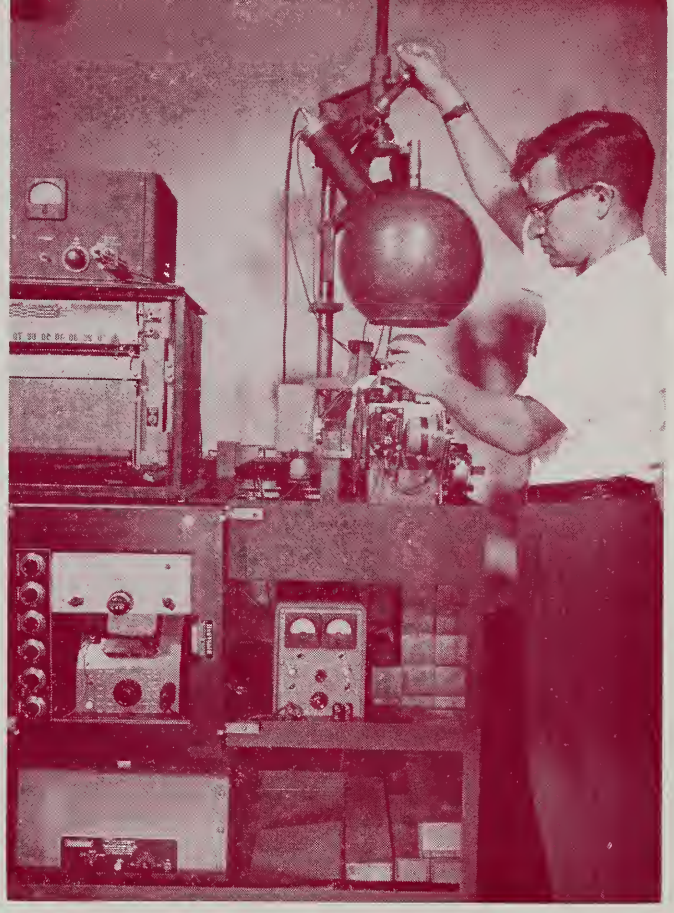
Research engineers in the Quality Evaluation Section of Agricultural Marketing Service believe they have found the answer. It's an instrument that measures and records the amount of light that is transmitted through a whole fruit.

Christened the "Rephobiospect"—*Rec*ording *Pho*tometer for *Bio*logical *Spec*tral *T*ransmission, the instrument yields information by means of transmitting light through the sample which can then be related to certain quality factors of the fruit. Here's how it works.

A monochromator breaks up into various colors the light passing through the fruit so that the sample is illuminated first with red light, then orange, yellow, and so on. Meanwhile, the phototube focused on the fruit produces an electrical signal proportional to the amount of light passing through the sample.

This signal is automatically recorded on paper, giving the researcher a graphic expression of the color of the fruit.

By obtaining graphs of several samples, researchers can then relate light transmission to color or other quality factors of the fruit. This measure of the transmitted light indicates the internal color which may be quite different from the external appearance.



Placing tomato in position to record spectral transmission curve.

Most of the research with the Rephobiospect has been with tomatoes. But samples have been studied varying in size from tomato seeds to large grapefruits. It is hoped that watermelons can also be measured.

At present the Rephobiospect is strictly a research tool. It is entirely feasible, however, to convert the instrument to commercial use. In practical application the recorder would not be needed, and the monochromator would be replaced by two or more small glass color filters.

Currently, AMS engineers are constructing an instrument which will be able to grade tomatoes into color categories varying from green to red. Adapting this instrument to a fast moving assembly line in a packing or processing plant is quite possible.

When put to work commercially, the instrument could evaluate the quality factor as fast or perhaps faster than the fruit could be mechanically handled without damage. It could even grade fruit or reject defective produce as it is brought into the plant.

This present research should eventually enable the corner grocer to present higher quality produce to the consumer, and should enable the processor to pay the grower more nearly in proportion to the quality of his product.

GRAIN TRANSPORTATION

CAN BE IMPROVED

By Joseph F. Kirby

Inadequate supplies of high-grade boxcars and congested railroad facilities prove a real headache to grain producers during harvest time. To get the best returns for their grain, producers should be in a position to move their crop quickly, if necessary, from the country elevator to the terminal market. And this is not always possible.

The number of railroad cars available each year for shipping grain is sometimes inadequate to meet transportation requirements during periods of peak activity. Since 1946, the number of freight cars has declined by 50,000 units. Included in this decrease were 4,000 boxcars.

During this same period, industrial production has gone up over 55 percent and agricultural production about 26 percent.

Obviously, this reduced supply of boxcars and other equipment must be operated efficiently to handle the increased production. Present equipment must be used to its utmost capacity. This means there must be little delay in turnarounds between loadings, and more loads must be carried by each car.

Just how much time is spent in the movement and handling of boxcars was recently studied by the Transportation and Facilities Branch of AMS in conjunction with several western grain hauling railroads. Time studies were made of each of the principal steps in the grain transportation operation.

From these studies, researchers were able to point out improvements that would be beneficial not only to the producer but to the railroad and to the operator of the elevator.

Two important grain markets were observed—Enid, Oklahoma, and Wichita, Kansas. Enid is served by 3 railroads and Wichita by 5, plus a switching road which makes deliveries for all railroads to 6 of the 12 Wichita elevators.

Wichita elevators have a combined capacity of 51,660,000 bushels, with 1 elevator handling 19,600,000 bushels, or 40 percent of the total capacity. Enid has 17 elevators, with a total capacity of 67,731,500 bushels. Four of the 17, with a combined capacity of 50,300,000 bushels, are operated by a farmer cooperative association.

Within a 50-mile radius of Enid, time studies were made from the time of placement of the empty boxcar until the car was loaded, moved to the unloading place, and then returned to its point of origin. At Wichita, researchers only measured terminal delay.

The survey began at the country elevators near Enid, where they studied 325 cars. Although some elevator operators began loading out as soon as an empty was placed, the average time a car was held before loading out at the elevator was 13½ hours.

It took 35 minutes to load, close the outside car doors, and place the railroad seal. Then, all too often,

the car sat on the siding for a day or so awaiting movement to the terminal market. A few cars moved within 1 hour after loading—these were the exception. A few waited as long as 120 hours; the average was 16 hours.

Such time lags—13½ hours before loading and 16 additional hours before moving the car out—can prove costly for both the elevator operator and the railroad.

However, shippers did indicate that recently improved car distribution by the railroads had helped move a greater volume of grain.

They still complained, though, about the supply of empty cars and the slow movement of loaded cars from an elevator on a branch line.

In some cases, motortrucks were used to haul the grain to market. This not only relieved the shortage of cars but improved elevator services.

Elevators were thus able to empty space for the receipt of grain that otherwise could not have been accepted from the farmer.

But delays were also encountered at the terminal market. The consignee often was slow to order the car placed at a particular elevator or shipped to another market. At Enid, this order came 18 hours after the car arrived, and at Wichita, 36 hours.

For loads received by one railroad and ordered placed to an elevator or mill located on another line, 8½ hours elapsed at Enid before delivery was made. At Wichita, this interchange took 23 hours.

Researchers also measured unloading time. Two types of unloading equipment are used at both Enid and Wichita—the automatic car dumper and the power shovel. Using the power shovel method, a 4-man crew takes 30 minutes to place the carload over a receiving pit, unload the car, remove the empty from the pit, and clean the car.

The automatic dumper enables the same crew to empty the car in 5 minutes. However, these dumpers are used only at the larger elevators and mills whose capacity and turnover are great enough to warrant their installation.

The total time required to complete the 6 principal operating stages in terminal turnaround was 50 hours at Enid and 96 hours at Wichita.

However, the situation at Wichita is somewhat more difficult than at Enid because of the 5 railroads entering the terminal. A much higher proportion of cars is interchanged. Also, the largest elevator at Wichita, with almost 20-million-bushel capacity, is located across the city from the other warehouses. Because of these and other differences, direct comparisons between Enid and Wichita are not possible.

But many operational procedures at Wichita could, nonetheless, be improved. Information and instructions could be verbally exchanged between the grain trade, the railroads, and the inspection services. Written confirmation could come later. Advance information of car arrivals at rail terminals would permit more efficient development of sample takers, earlier inspection of cars.

Steps are being taken in Wichita to improve the situation. Inspection authorities are reviewing their procedures. A number of interchange tracks are being lengthened by the railroads and consideration is being given to means of better coordination of the activities of all parties to the operation.

The railroads are alert to the needs of the shippers and aware of the possible loss of traffic to competing transportation facilities. At harvest periods, they are constantly striving to obtain maximum utilization of their cars.

It should be remembered, though, that improvement of car efficiency is not only the responsibility of the railroads but of the shippers and receivers as well. Prompt loading, billing, and forwarding instructions are vital. Also, the railroad must be notified promptly when the empty car is available. Circuitous routing, unnecessary weighing, and ordering cars in excess of requirements must also be avoided.

This mechanism lifts a freight car end tilts it, sending the grain down beneath the elevator, which hoists it to the storage space.

A TRAFFIC SIGNAL SYSTEM FOR COSTS

By H. Wayne Bitting

In industry, there are two roads to greater profits—increased sales and reduced operating costs. Every frozen food distributor tries to follow both. But reducing operating costs is not as simple as it sounds.

A traffic signal along the way would prove extremely helpful.

It should be a simple device to enable management to look quickly at each operation to see whether it registers a green light, a caution, or a danger signal. It should also reflect changes occurring in the marketing system.

Actually, such a system has been developed for distributors of frozen foods by the Marketing Research Division of Agricultural Marketing Service as a part of its broad research program to discover ways of improving marketing to the benefit of producers, marketing agencies, and consumers.

This system allows each firm to compare costs of each of its operations with the average and range for the industry. It signals to management each operation which appears to be high or low in relation to other firms.

Here's the way this system was created. First of all, it required the following: (1) Cooperation by the industry in supplying cost information to a central office on a strictly confidential basis; (2) use of a uniform cost accounting system as a basis for reporting these costs; and (3) working up these data for use in the traffic signal system.

In obtaining cost comparisons for the industry as a whole, the identity of each firm was, of course, not revealed.

Included in the AMS survey of frozen food distributors were 30 cooperating firms ranging in size from $150,000 to over $5,000,000 in annual sales. The average sales volume for the group was about twice the total dollar volume of the average supermarket. All geographical regions were represented.

Researchers found that the net profit resulting from each $130 reduction in operating costs was equivalent to an additional $10,000 in sales. For every $1 increase in sales, distributors received on the average only 1.3 cents increase in profits, while a dollar reduction in operating costs afforded them an opportunity to add the full amount to profits.

To achieve greater profits by either increased sales or reduced costs, management must first know what the operating costs are. If these costs are to be reduced, it is necessary to know where they are high.

This is where the traffic signal system fits in. It can tell management where its costs are excessive.

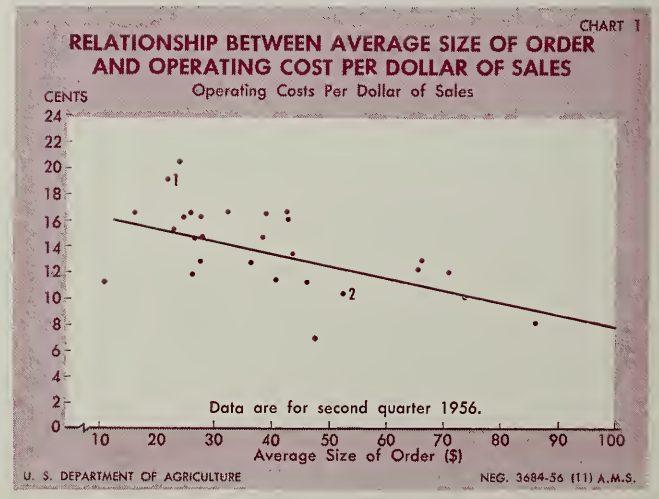
The charting operation—which actually establishes the traffic signal apparatus — involves plotting the group average along a base line. Firms either fall above or below this average. Variations can be quickly noted and comparisons easily made.

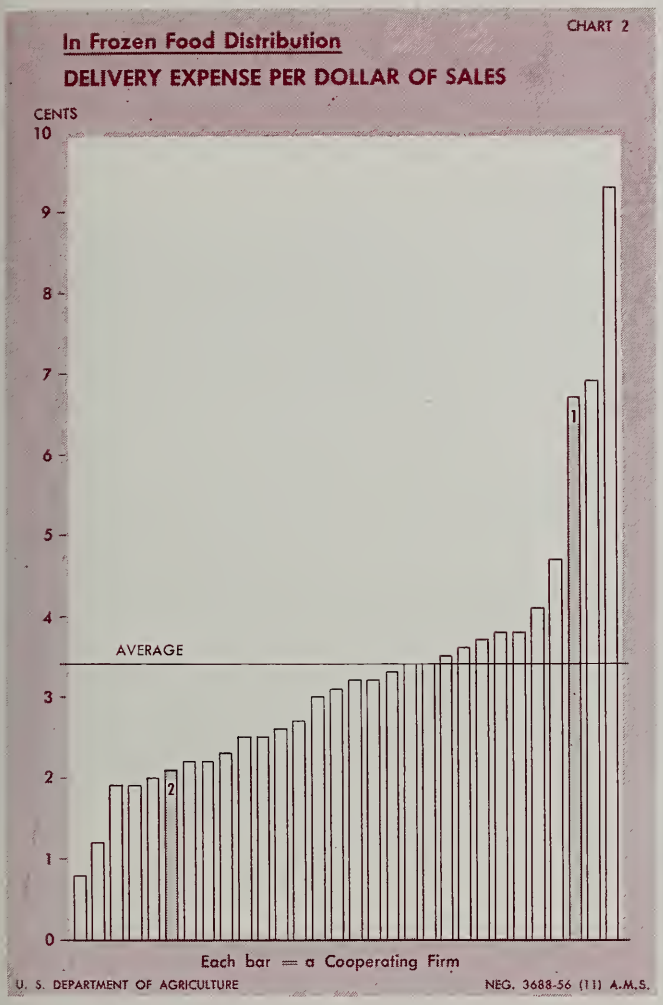
As an example of how the charting plan works, AMS researchers selected two specific firms—one with operating costs higher than average and one with below-average costs. They then prepared a series of charts for each major operating expense category, plotting each firm's expenses for these operations.

Firm No. 1, whose operating costs were higher than average, as shown in Chart 1, appeared above the base line in several areas. The charts pointed out exactly which expenses were excessive. In this case, the biggest difference lay in delivery costs per dollar of sales (see Chart 2). Here, costs rose much higher than for the average frozen food distributor. However, Firm No. 1's costs were not above average in all operations, as indicated in Chart 3.

Obviously, if the high-cost operations could be re-

The slanting line on this chart indicates that a $2 increase in the size of order results in a 1½ percent drop in operating cost per dollar of sales, using the average of the group as a base.





duced, the firm's total operating expenses would follow more nearly the base line—and its profits would be greater.

The charts also told the story of Firm No. 2's below-average operating procedure. By transferring the cost data to the charts, researchers quickly pinpointed the areas in which the firm operated more efficiently. Low order assembly expenses and delivery costs accounted for its chief advantages (Charts 2 and 3).

Not all distributors have operating expenses that fall into such marked patterns. But practically all firms show some areas of strength or weakness. The charts point up these categories, thereby helping management to identify the areas where adjustments are most likely to yield cost reductions.

Such charts also can be used to help estimate the potential savings which might be realized from an engineering study of a plant before the study is undertaken. The charts locate the areas which need to be studied more closely.

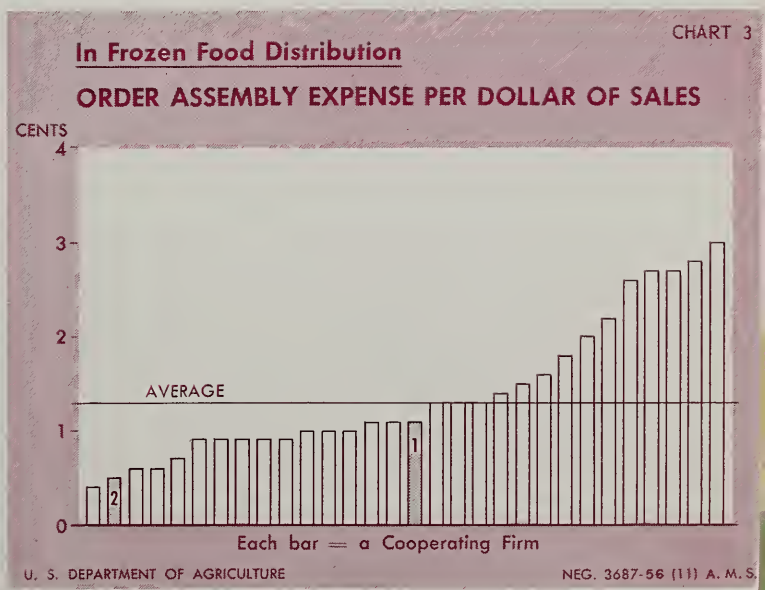
One interesting fact which the chart system makes amply clear is that firms with low operating costs do not always make the most profits. Neither do the higher operating cost firms make no profits. However, *as a group,* low-cost operators generally do average higher profits.

Why, then, aren't net profits used as the guide instead of operating costs? As is typical of most industries, profits in the frozen foods industry are often times due to market position. When more intensive competition enters the market, the operator with the lowest operating costs is most likely to succeed. For this reason, operating costs provide a more able guide to efficiency and increasing future profits than do net profits.

Other factors, of course, also figure in any consideration of operating costs. Prices paid for frozen foods, taxes, and wage rates may vary from city to city or region to region and lead to cost differences for equally efficient firms. The density of the trading area served, size of retail outlets, and number of competing firms are likely to affect distribution costs.

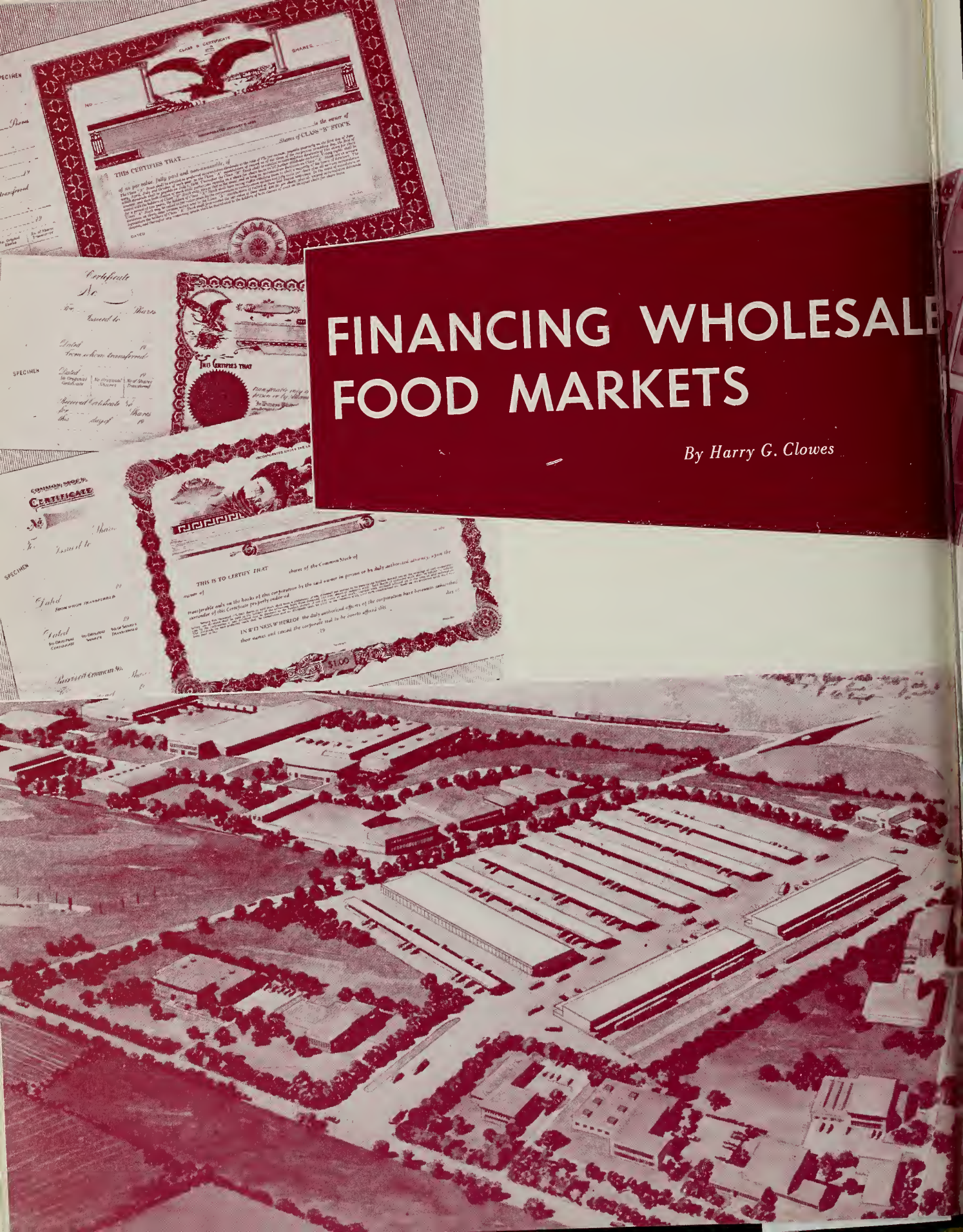
In addition to direct cost comparisons, the uniform cost accounting system enables analysts to develop operating ratios that are useful in diagnosing reasons for the cost increases. Such ratios indicate rates of inventory turnover, debt collection, relative expenses of serving different types of customers, averages of orders per hour of labor, and sales per hour of labor.

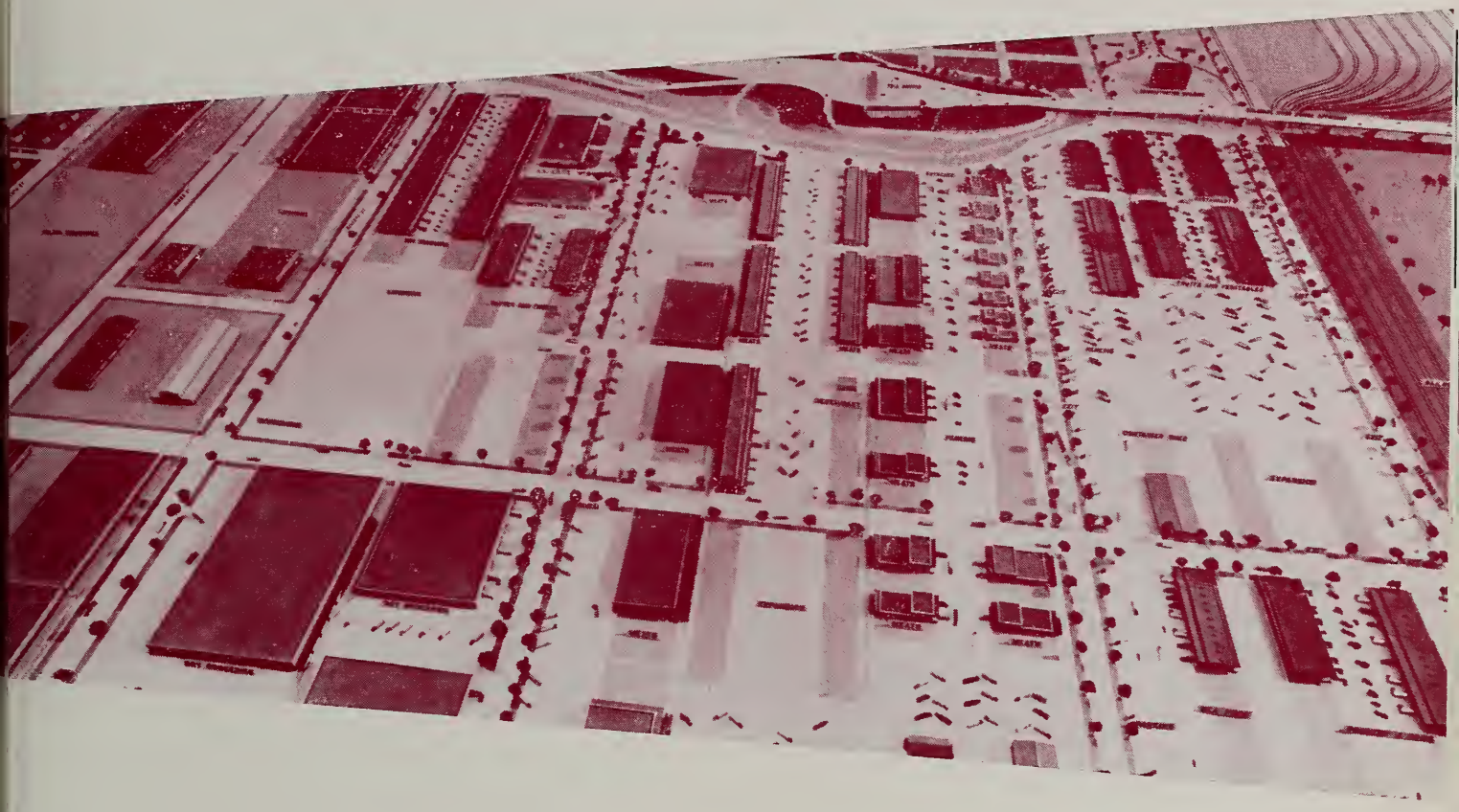
A traffic signal system for costs provides management with a convenient tool in planning the direction of adjustments for tomorrow. A uniform cost accounting system is essential for valid cost comparisons. It is, therefore, basic to industry's effort to increase the efficiency of frozen food distribution through improvements in the operations of individual firms.



FINANCING WHOLESALE FOOD MARKETS

By Harry G. Clowes





ENROUTE from the grower to the housewife, food moves through a number of marketing facilities, some of which may be old, outmoded, and inefficient. Wholesale food markets are no exception.

Research studies by the Transportation and Facilities Branch of AMS have revealed many defects in some of the wholesale food markets in this country: lack of space; inadequate refrigeration facilities; lack of direct rail communications; little mechanical handling equipment; no front or rear loading platforms; outmoded, multistory buildings of antiquated design; lack of parking space; and congested streets.

The defects in these facilities usually result in increased handling costs and greater waste and spoilage. These marketing costs are reflected in the prices paid by consumers and the returns received by the growers.

Market specialists of AMS have found in many of the areas studied that improved wholesale market facilities could offer an annual potential saving in food handling costs large enough to build a considerable part of a new market.

But the remodeling or rebuilding of old food markets presents a number of challenging and complex problems with respect to financing.

A large number of persons and firms operate in such markets. These markets usually consist of stores for handling various kinds of food products, stalls for farmers, restaurants, offices, and other facilities for individual businesses. They also include certain facilities for common use such as railroad tracks, streets, and parking areas.

While large firms occupying an entire building can own and operate their buildings, the provision of facilities for all other types of operators requires group action in both ownership and financing.

Several methods have been used to raise the funds needed to build some of the recently constructed wholesale food markets. The following examples are taken from a marketing research report on types of ownership and methods of financing wholesale food market facilities. The report will be issued in the early part of 1957.

Market "A" is in a metropolitan area—population, 300,000. The market supplies retail outlets in the area. It also serves as an assembly point for large quantities of produce for shipment to other consuming centers.

Facilities on the 50-acre site include 61 wholesale produce store units (30 of these have direct rail connections); 170 stalls for farmers and truckers under sales sheds; container sheds; team tracks; parking areas; and office building.

It cost $65,500 to develop the land; $147,000 for such facilities as railroad approaches, sewer and water connections, pavement, flood lights, fence, and public address system; $801,500 for construction of buildings. Total cost—$1,014,000.

At time of construction, tenants invested the additional sum of $300,000 in fixed improvements for refrigerated boxes, and other equipment.

The State owns and operates the market. To finance the cost of the market, the State appropriated about $250,000; the county, $50,000; and the city in which the market is located, $50,000. To obtain the rest of the money, about $650,000 in revenue bonds were sold on a bid basis to investment houses.

Revenue bonds were of $1,000 denomination; they carried 2.65 to 2.75 percent interest, depending upon maturity date. The faith and credit of the State is not pledged, but bonds are payable and are secured by a pledge of the revenue derived from operation of the market.

The bonds mature in numerical order, with approximately $25,000 maturing each year over a period of 25 years. The bonds are subject to call by the State at its option in inverse numerical order.

A reserve of $400 per month is set aside from revenues as a cushion for contingencies and as an additional security on the bonds. If on the 50th day preceding interest payment dates there is a surplus in the "Cushion Fund" which exceeds the requirements of the fund by as much as $5,000, additional bonds may be called for payment.

If any bond is called for redemption before its stated maturity date, the redemption price includes the accrued interest to the date of redemption. A redemption premium of 2½ to 4 percent of the principal amount of the bond redeemed is given to bond holders, depending upon the unredeemed time the bond has to run before maturity.

The State is obligated to place into effect and maintain a schedule of rentals and rates, for the use of facilities and for other services, which will produce revenues sufficient to provide for: (1) Adequate operation and maintenance of the project; (2) punctual payment of principal and interest of the outstanding bonds and any additional bonds that may be issued; (3) adequate reserves for bond and interest payment, contingencies, improvements, extensions, additions, and enlargements, and (4) for use in replacing depreciated and obsolete facilities.

Market "B" is in a metropolitan area—population, 2,500,000. Facilities owned and operated by a market corporation include 98 wholesale store units in 4 buildings, and approximately 100 farmers' stalls. Other facilities include team track yard for 350 rail cars, a holding yard for 1,000 rail cars, an auction building, wholesale grocery establishment, cold storage warehouse, fresh vegetable prepackaging establishment, frozen food manufacturing plant, garage and gas station, and a bank.

The market was built by a private corporation. Initial investment approximated $3,500,000. The original market land and construction costs were financed by an issue of 3,000 shares of capital stock, which was sold to members of the trade and a holding corporation for $150,000, approximately $350,000 in short-term notes, etc.; and a 25-year revenue bond issue of $3 million. These bonds, which were sold to one of the original owners, have been liquidated. Each lessee of the market and store facilities is a stock owner.

Several additional series of indentures, which total $1,500,000, have been issued since the market was organized. These indentures were to finance improvements, including the frozen food plant, and additional land acquisition made since the original bond issue was negotiated. The team track yards, cold storage plant, and auction facilities were built by other concerns at a cost of $3 million.

Recent issues of indentures were bought by local banks. One series of the indentures bears interest at the rate of 4-percent per annum, payable monthly. Monthly installment on this note amounts to $1,200 with provision for additional monthly installments equal to the amount of rentals received from certain leased wholesale store units.

The agreement with the bank further provides that, if the corporation declares or pays a cash dividend in excess of $6 per share, it will pay the bank an amount determined by multiplying each excess by the number of shares pledged as security for these notes on the date of the payment which created such excess.

The most recent issue of indentures is backed by a first mortgage on the land and improvements of the frozen food plant and bears interest at 5 percent.

Leases on the market facilities stipulate, among other things, the minimum rentals and provide that "rentals" from the market facilities are to be used to liquidate the cost of constructing the facility.

Cost and expense of operation of the market are

charged directly to the tenants, and are in addition to the tenant's rental charge.

Market "C" is in a city of about 500,000 population. Present facilities include 64 wholesale store units and 72 farmer-trucker stalls. All store units have direct rail connections. The market, operated by a dealer-owned private corporation, represented an initial investment of $1,200,000 in land and buildings.

To partly finance the project, the dealer-owned corporation issued capital stock and sold 1,500 shares at $100 per share to 4 principal underwriters. It also sold 250 shares to small dealers. A smaller amount of stock was bought by other dealers.

Ten-year debenture bonds bearing 4-percent interest per annum were sold to raise an additional $170,000. These bonds, backed by 10-year leases on the wholesale produce stores and second mortgages on the property, were taken by private investors who were principally the lessees of the facility.

Ten-year first mortgage bonds bearing 5-percent interest, endorsed by a holding corporation, were sold to local investment interests to raise approximately $525,000. An additional $160,000 in second mortgage bonds was bought by the holding corporation. Subsidiary bonds approximating $45,000 were also sold to pay for the construction of the garage-service station facility. These bonds were bought by the lessees of this facility.

Market "D" is in a metropolitan area of about 750,000 people. Facilities include 27 wholesale store units and 225 farmer-trucker stalls. All store units have direct rail connections. Other facilities include a restaurant building and brokers' offices.

The market was built in 1935 by a farmers' cooperative association at a cost of $120,000. Since that time, new facilities have been added. Cost—$280,000. Additional service facilities costing $45,000 were paid for by the railroad serving the market and the city in which it is located.

Three series of capital stock have been issued by the cooperative association. The issue of common stock consisted of 200 shares with an original par value of $100. Each member of the association must own at least 1 share but not more than 2 shares of common stock. The stock has voting privileges.

There are two series of preferred stock—these stock owners have no voting privileges. Two hundred shares of preferred stock series were issued with par value of $100. The stock is currently paying 6- and 7-percent dividends.

The association admits as members only persons or firms who are "bona fide" growers or fruits and vegetables, or flowers, in the county in which the market is located or an adjoining county.

Loans of $100,000 were made to cover cost of land and construction. Since 1935, the association has also issued "open" debenture notes with 5 percent interest, maturing in 4, 5, or 6 years in the amount of approximately $250,000. This was used for the construction of additional market facilities.

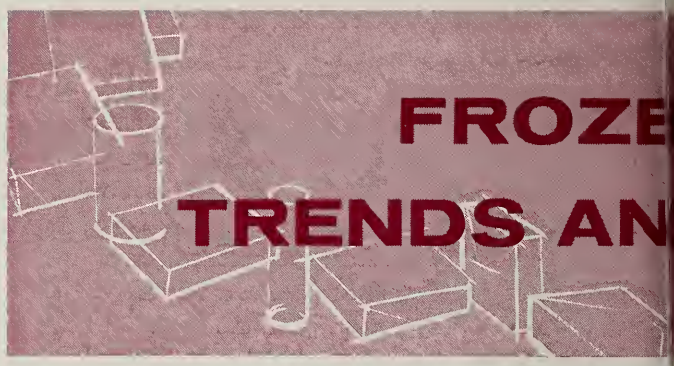
Market "E" is in a metropolitan area. Present facilities include 84 wholesale store units in 2 buildings, 120 farmers' sales stalls in 2 buildings, 70 buyers' stalls in 2 sheds, 22 sellers' stalls in 1 building, direct rail connections with a major trunk line railroad. Other facilities include a gasoline station and service garage, offices for brokers and market administration, bank, public scale.

This facility was financed and built in 1951 by the development corporation unit of a construction firm. The market was sold to a dealer-owned corporation—its present operator. Initial investment in buildings, land, and service facilities approximated $2,100,000.

The market corporation has issued 4,000 shares of common stock with a par value of $100 per share. No one person or group of persons may own more than 30 percent of the outstanding issue of common stock. There are now about 120 stockholders. The long-term debt is made of a first mortgage note of $1,800,000 to be amortized over a 20-year period with interest at 5 percent. It was sold to a life insurance company. The note is secured by a mortgage on the land, administration building, and produce facilities.

Market "F" serves an area of 150,000 persons. Facilities include 9 wholesale fresh fruit and vegetable store units, 31 farmers' and truckers' sales stalls in 2 buildings, and a gasoline station and service garage. The market is served by a major railroad. It was built in 1949 and is now operated by a county marketing commission established by the State legislature. Total cost of land, buildings, and service facilities approximated $230,000.

Original construction and cost of land was financed by an appropriation by the county supervisors of $100,000 and county obligation notes approximating $95,000. The notes were sold to 3 local banks. These notes are for 10 years and carry interest at 3 percent. An additional $35,000 was secured by county appropriation and from funds of the State agricultural commission.



FROZE
TRENDS AN

CONSUMERS are buying more frozen food and it looks like their demand will continue to increase in the future. That's what economists of the Market Organization and Costs Branch of AMS found when they studied the outlook for frozen foods.

They made the study to see what the growth of the frozen food industry means to farmers and what effect frozen foods have on marketing costs.

Frozen food production doubled between 1946 and 1950, and by 1953 nearly doubled again. Production in 1955 was about four and a half times the 1946 output.

Production in all groups of frozen food has been increasing, but frozen orange juice concentrate has accounted for more than half the growth.

Recently, frozen prepared foods have increased most rapidly. Frozen meats may account for much of the increase in the next few years.

Current economic and social trends — increasing population, higher incomes, and the demand for convenience foods—are forces which favor a continuing build-up in production.

Our population has been growing rapidly. The fact that there are more people to feed may be more important for some frozen foods than increasing per capita consumption.

Many families seldom or never buy frozen foods. But higher incomes, more low-temperature storage space in the home, more frozen food cases in stores, increasing awareness by consumers, and continued improvement in quality may cause a larger proportion of families to become regular purchasers of frozen foods.

The transfer of tasks from the home kitchen to the marketing system has been going on for years. Marketing of products in frozen form enables the marketing system to provide more services along with the food products which consumers buy.

Frozen foods save time and effort in shopping and the preparation of meals. As a matter of fact, many need only to be warmed before serving.

Prepared frozen foods, now the fastest growing part of the industry, offer the housewife the most built-in maid service. More than 200 of these items are now being marketed; 1955 production exceeded 500 million pounds, 60 percent more than the 1954 total. Frozen potato products headed the prepared field during 1955.

Four items — french fried potatoes, poultry and meat potpies, fish sticks, and dessert pies — together accounted for two-thirds of total output. Most of these products were marketed in retail stores.

The growing demand for convenience foods is well shown by the popularity of prepared dinners among household consumers. Other markets for prepared frozen food are also expanding.

Many small restaurants in the future may find it profitable to adopt the practice. Frozen prepared dinners offer a wide selection, reduce waste, and enable a relatively low paid restaurant worker to substitute as a chef.

Quick freezing makes many seasonal food items available throughout the year. Increased demand for frozen products seems assured if they are competitively priced and a good quality substitute for the fresh or canned product. By lengthening the marketing season, quick freezing may increase total demand for some products in the future.

In order to attract and hold steady customers for

frozen foods, confidence in quality must be built. For the most part, frozen foods are packed in cartons and the contents cannot be inspected. Quality of fresh foods is apparent to some extent when displayed in the open, a practice which has conditioned the public to the "feel" and sight type of purchase.

Federal grade labels which sometimes appear on containers of strawberries, lima beans, and citrus juices, help consumers choose frozen products. For most frozen foods, however, previous experience with the same brand is the only guide for purchase.

Disappointment in quality may seriously discourage repeat or frequent buying.

Processors, distributors, and retailers are gaining knowledge and experience needed to improve quality. Private organizations and governmental agencies are conducting research to learn more about the effects of temperature and humidity upon quality, about changes in the product during freezing, and other phases of marketing where quality may be affected.

Plant breeders are developing varieties of fruits and vegetables better adapted to freezing.

The urgency for quality improvement and control is not a concern of the frozen food industry alone. Efforts are being made to improve quality and reduce costs of marketing food products in fresh, canned, and dehydrated forms to improve their competitive position. This will affect the demand for frozen foods.

Prospects for reducing costs of frozen foods, relative to costs of competing foods, may be brightest in the distributing phase of the marketing process. Because temperature of the product during delivery must be kept at 0° F., delivery is an expensive operation.

Many retail stores have no storage space for frozen foods except display cabinets. In order to display a wide assortment, only a few packages of each can be kept in the cabinet.

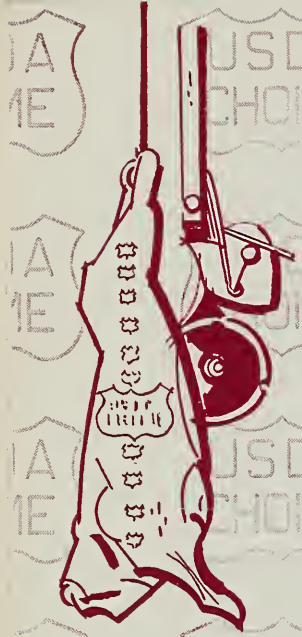
Continued growth of the frozen food industry will require more processing plants, warehouse space, refrigerated transportation equipment, and retail store cabinets. New products and improvement in quality of present products also will be part of this expansion.

Rate of future development is dependent upon relatively low prices for frozen foods, compared with prices for competing foods. Various technological developments are aimed at reducing costs both of processing and handling frozen foods.

What does the growth of the frozen food industry mean to America's farmers? Although fruit and vegetable products have been the most directly affected, current trends indicate that future expansion may affect other producers. No generalization regarding impact on farmers applies equally to all producing areas or individual products.

Freezing may increase the demand for some farm products at the expense of others. Shifts from fresh use to use of the same product in frozen form may change competitive relationships among various areas producing a specific farm product.

Value of the farm product and cost of the frozen food item may well get farther and farther apart. Cost of the farm product may be only a fraction of the retail price of some frozen foods because so much processing is done in the factory instead of in the home. On the bright side, however, is the possibility of a widely expanded market for some farm products by this additional processing — and the farmer's total returns may well be increased.



USDA STANDARD

The New Beef Grade

By C. E. Murphey and W. Edmund Tyler

USDA Standard is the newest grade of beef. It was adopted by the U. S. Department of Agriculture on June 1, 1956, at the recommendation of the cattle and beef industry.

Now there are eight official grades for beef. Six of these — Prime, Choice, Good, Standard, Commercial, and Utility—may be found in retail stores. The other two—Cutter and Canner—are ordinarily used in processed meat products and are rarely, if ever, sold as cuts in retail stores.

Agricultural Marketing Service specialists indicate that beef graded Standard will usually sell for a somewhat higher price than Commercial grade. On that basis, Standard might be considered as the "higher" grade.

However, from a technical grading standpoint, Standard and Commercial are considered to be on a par. Why then the new grade? Here's the background story.

Before 1939, beef carcasses produced from steers, heifers, and cows were graded on separate standards. The stamp applied to the meat indicated the sex in conjunction with the grade. Since beef from a Choice grade, fully mature, cow carcass could not compare with that from a Choice grade, young, steer or heifer carcass, consumers had to consider both sex and grade when buying beef.

In 1939, beef grades were simplified for those who used the higher grades when the grade standards for beef from steers, heifers, and cows were combined. Sufficient emphasis also was given to maturity as a grade factor so that Commercial was the highest grade for beef from fully mature animals.

That revision made the Prime, Choice, and Good grades more uniform in quality than they had been. However, it made the Commercial grade more variable in its characteristics. Although beef from young animals continued to be divided into all of the seven grades, beef from mature animals was restricted to the four lower grades.

The Commercial grade thus included the fattest, very best carcasses produced from mature animals. But it also included carcasses from young animals with a much lesser relative development of their various grade factors—particularly their degree of fatness.

Because of the very limited demand for the grading of Commercial beef, it was not until after the compulsory grading period during World War II that the effectiveness of this change could be properly evaluated. Then, it became evident that the range in characteristics of beef in the Commercial grade was much too great. The different kinds of carcasses in that grade could not be merchandised on the same interchangeable basis as could beef in the Prime, Choice, or Good grades.

This undesirable situation was partially corrected in 1950 by a revision of the standards. At that time, younger carcasses in the upper half of the Commercial grade were put in a separate grade and labeled "Good." This grade has since become popular and rather widely used.

However, after this change the same widespread range of variability remained in the Commercial grade since it still included beef from animals of the full range of maturity.

Thus, the Commercial grade continued to be much less useful to the meat trade and to consumers than the other grades. This was again emphasized under compulsory grading during the Korean emergency. Following that period, most beef eligible for the Com-

mercial grade was sold either ungraded or was identified with private brands.

Anxious for the Commercial grade to serve in the same way as the higher grades, the cattle and beef industry recommended that it be split again. This time they suggested that it be split strictly on a maturity basis, since the greatest variation in the grade hinged on this factor.

The industry felt this division would increase the amount of such beef that would be federally graded. Also, the advantages of grading would be extended to other groups of consumers and producers. AMS officials concurred with the cattle and beef industry that the plan had merit. Following the usual procedure for such changes, the new grades went into effect.

Beef produced from younger animals was given the name Standard. The Commercial grade name was retained for beef produced from mature animals.

Because Standard grade beef is produced from young animals, it has rather red, porous bones and a rather fine texture and light red color of lean. It usually has only a thin covering of outside fat and only a very limited amount of marbling intermingled within the lean. Such beef will be relatively tender but is rather mild in flavor and lacks the juiciness of beef with more marbling.

Commercial grade beef, produced only from mature animals, has rather hard, white flinty bones and a rather coarse texture and dark red color of lean. Since this is the highest grade for which fully mature beef is eligible, it has a thick covering of outside fat and a liberal intermingling of marbling within the lean.

Commercial grade beef usually will lack the natural tenderness of beef produced from young animals. It usually requires long, slow cooking in moist heat to make it tender and to develop its rich, full flavor.

The Utility grade falls just below both the Standard and Commercial grades. This grade, like the former Commercial grade, includes beef from animals of all maturities. Thus, beef which has an insufficient development of grade factors for either Standard or Commercial receives the Utility grade stamp.

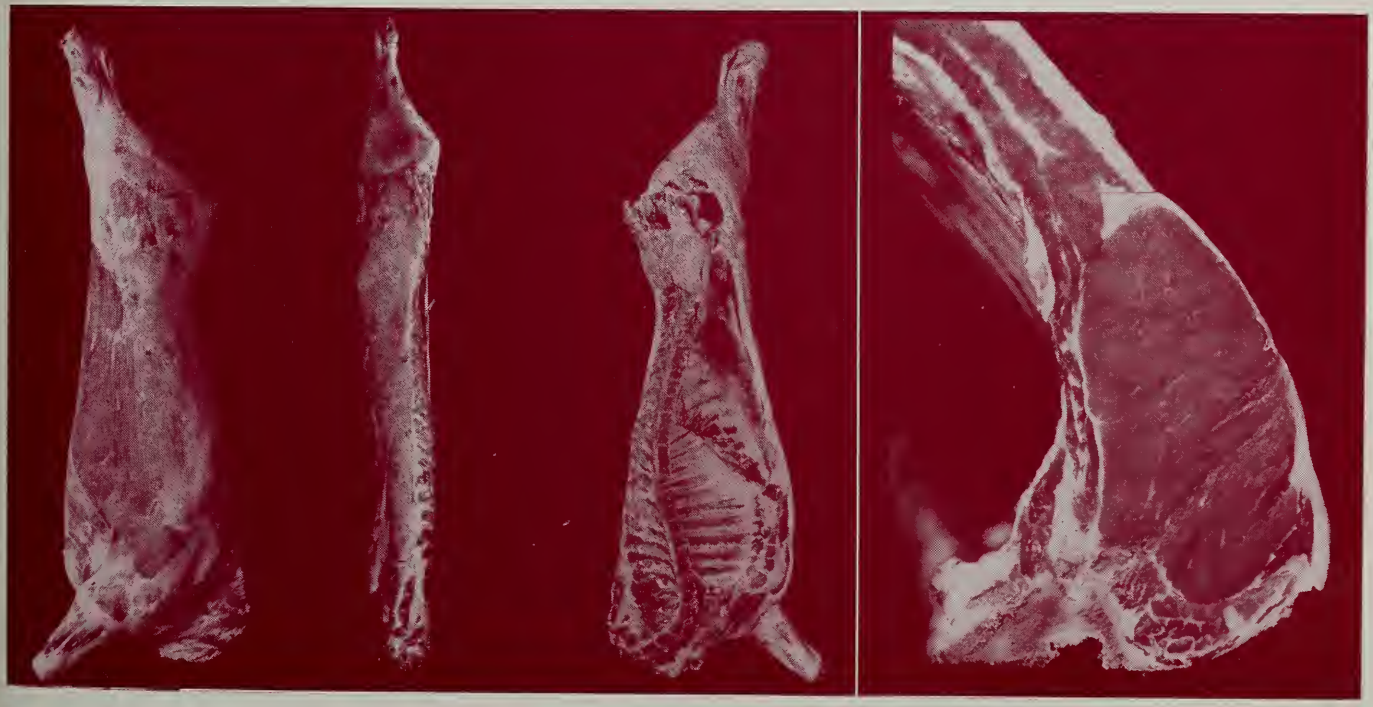
One of the obvious advantages of Federal meat grades is that they furnish a means for identifying meats that have similar characteristics. They provide consumers with a reliable tool for purchasing the quality of meat they prefer. The new Standard grade should do this for consumers who prefer to use beef of this quality.

In addition, Federal meat grades give packers, wholesalers, and retailers a reliable means of trading at wholesale and retail levels. Again, the new grade should be an aid to those in the industry who handle this quality of meat.

If, as expected, the demand for Standard beef rises and the costs of marketing go down, producers of Standard grade beef will benefit by higher prices.

The revision thus benefits all segments of the livestock and meat industry who handle or use Standard and Commercial grade beef.

Three views of a Standard grade beef carcass. Rib roast on right shows typical proportions of fat and lean in Standard grade beef.



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OFFICIAL BUSINESS

Delivery Truck Dispatching

By Theodore H. Allegri

For routing special deliveries or for training employees in routing or dispatching, you can't do without a map. And when the map is part of a mosaic of other maps, you can achieve the kind of flexibility that is needed to get the job done quickly.

The dispatching table illustrated here was designed by the author as an integral part of a system for dispatching delivery trucks with out-of-phase orders.

These orders — a necessary evil in areas of keen competition — have long plagued truck dispatchers. Now, by a new method devised by the Transportation and Facilities Branch of Agricultural Marketing Service, they can be handled more easily.

The table, which forms the base of the operation, is composed of a series of shelves to accommodate sales territory maps. Its side leaves allow a selection of these maps to be placed side by side. In this way, the dispatcher can select the best route for these "rush" orders and assign them to the proper trucks.

The maps themselves are made of rectangular pieces of fiberboard upon which enlarged postal zone maps have been glued. A plasticized coating or transparent plastic overleaf is applied to the map face.

Each map covers a specific sales territory with the delivery stops plainly marked according to a predetermined code. Together, the maps cover the entire area served by the delivery operation.

As the invoice for an irregular stop reaches the dispatcher, he marks it. A coded sequence for preliminary truck routing is used. Early stops are marked on the overleaf according to location code, and flag stops designated for final truck routing.

The new mosaic map plan is also helpful for regularly serviced stops, since the same customers do not always make up the delivery route.